

Asotin Creek Spring Chinook Salmon Population

The Asotin Creek Spring Chinook population (Figure 1) is part of the Snake River Spring/Summer Chinook ESU which has five major population groupings (MPGs), including: Lower Snake River, Grande Ronde/Imnaha, South Fork Salmon River, Middle Fork Salmon River, and the Upper Salmon River group. The population is one of two extant populations in the Lower Snake River MPG. For general descriptions of the Tucannon and Asotin subbasins see NPPC (2004) or the Snake River Salmon Recovery Plan for SE Washington (2005).

The ICTRT classified Asotin Creek as “basic” in size based on historical habitat potential (ICTRT 2005). This classification requires a minimum abundance threshold of 500 wild spawners with sufficient productivity to exceed a 5 % extinction risk on the viability curve (ICTRT 2005). Additionally, the Asotin Spring/Summer Chinook population was classified as a “type A” population (based on historic intrinsic potential) because it has a linear structure with only one major spawning area with limited capacity (ICTRT 2005).

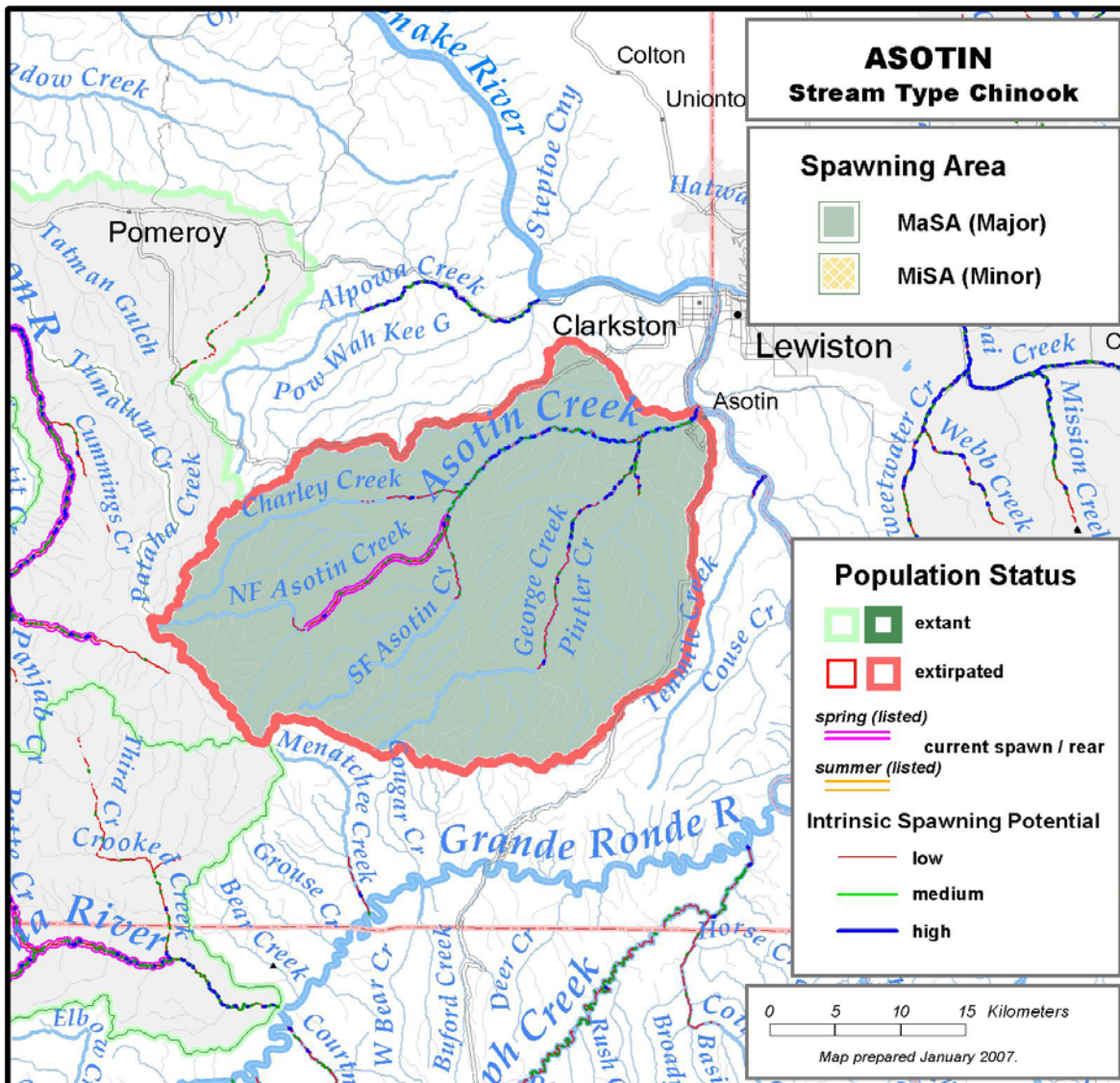


Figure 1. Asotin Creek Spring Chinook Salmon population boundary and minor spawning area (MiSA).

Table 1. Asotin Creek Spring Chinook Salmon population basin statistics and intrinsic potential analysis summary.

| | |
|--|---------------------------|
| Drainage Area (km ²) | 844 |
| Stream lengths km (total) ^a | 338.1 |
| Stream lengths km (below natural barriers) ^a | 322.7 |
| Branched stream area weighted by intrinsic potential (km ²) | 0.124 |
| Branched stream area km ² (weighted and temp. limited) ^b | 0.001 |
| Total stream area weighted by intrinsic potential (km ²) | 0.200 |
| Total stream area weighted by intrinsic potential (km ²) temp limited ^b | 0.058 |
| Size / Complexity category | Basic / A (simple linear) |
| Number of Major Spawning Areas | 0 |
| Number of Minor Spawning Areas | 1 |

^aAll stream segments greater than or equal to 3.8m bankfull width were included

^bTemperature limited areas were assessed by subtracting area where the mean weekly modeled water temperature was greater than 22°C.

Current Abundance and Productivity

Very few Spring Chinook currently utilize the Asotin Creek system. Asotin Creek and its North and South forks are reported by WDFW to support occasional Spring Chinook spawning (SRSRB 2005). Spawning has been documented in the mainstem and North Fork Asotin from the Lick Creek confluence to near the border of the Umatilla National Forest.

Spring Chinook abundance has declined steadily since the early 1970's, with very few redds being reported after 1985. Although survey counts have been conducted since 1972, it is unknown how comprehensive these efforts have been. Additionally, it is unclear whether adults observed in the system are of native or hatchery origin.

Comparison to Viability Curve

- Abundance: Unknown
- Productivity: Unknown
- Curve: Hockey-Stick curve
- Conclusion: Asotin Creek Spring Chinook population is at **HIGH RISK** based on the uncertainty in current abundance and productivity.

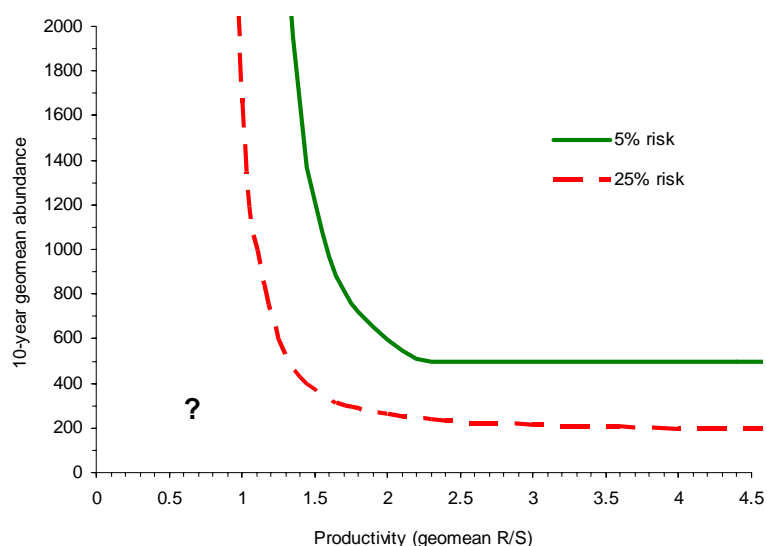


Figure 2. Asotin Creek Spring Chinook Salmon population abundance and productivity metrics are unknown. Due to this uncertainty, the population is suspected to be at high risk.

Spatial Structure and Diversity

The ICTRT has identified one intrinsic Minor Spawning Area (MiSA), within the Asotin population. Although total weighted habitat within Asotin spawning branches is greater than the Major Spawning Area (MaSA) threshold, high water temperatures likely limit the modeled geographic range.

The intrinsic potential analysis identifies spawning branches in the lower reaches of the Asotin, however, current spawning has been documented only in the upper mainstem and North Fork Asotin from the Lick Creek confluence to near the border of the Umatilla National Forest. Other reaches may be accessible during the period of spring runoff, but holding habitat is currently limited to the North Fork and mainstem.

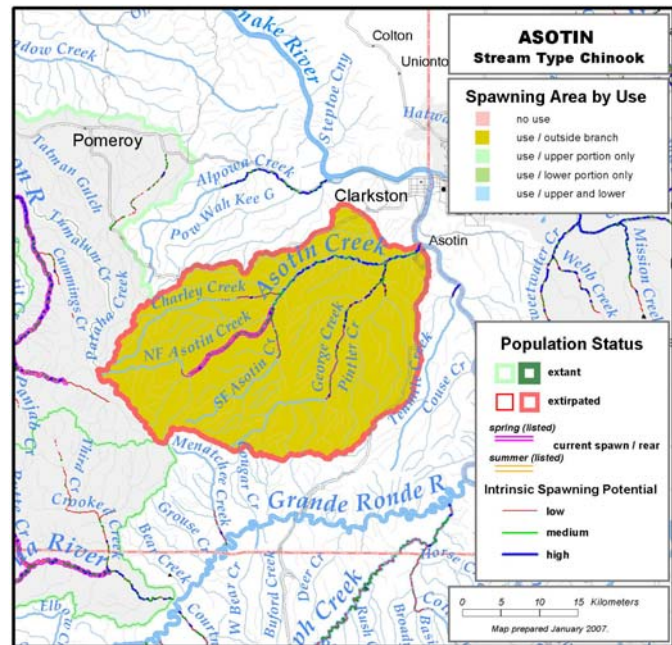


Figure 3. Asotin Creek Spring Chinook Salmon population current spawning distribution and spawning area occupancy designations.

Factors and Metrics

A.1.a Number and spatial arrangement of spawning areas.

The Asotin Spring Chinook population has only one MiSA. The MiSA has not been occupied on a consistent basis, so it is at *high risk* (SRSRB 2005).

A.1.b. Spatial extent or range of population.

The Asotin Spring Chinook population has one MiSA. The MiSA is nominally occupied, so it is at *high risk*. Current spawning has been documented only in the upper mainstem and North Fork Asotin from the Lick Creek confluence to near the border of the Umatilla National Forest. Other reaches may be accessible during the period of spring runoff, but holding habitat is currently limited to the North Fork and mainstem.

A.1.c. Increase or decrease in gaps or continuities between spawning areas.

Increases or decreases in gaps between MaSAs are not possible for this population due to its simple spatial structure so this metric is *not applicable* to this population.

B.1.a. Major life history strategies.

The Asotin spring/summer Chinook population is *very low risk*, because no major life history strategies have been lost. This rating assumes that there never was a separate spring and summer run of Chinook in the Asotin.

B.1.b. Phenotypic variation.

We do not have data available for this metric. Even if we determined that there was a change to one or more traits we do not know what the exact baseline is because changes likely occurred before there was biological monitoring. Therefore, we will assume that

there has been some change and increase in variance for 2 or more traits placing the population at *moderate risk*.

B.1.c. Genetic variation.

High risk based on likely bottlenecks from so few spawners in the last several generations. **Michelle, Paul, and Fred will have to do this one. I am not familiar with any genetics work from fish in Asotin Ck.**

B.2.a. Spawner composition.

Moderate risk (no data): So few redds have been observed in recent years and carcasses have not been recovered. All 4 metrics for this factor will have to be rated the same based on no data.

B.3.a. Distribution of population across habitat types.

The distribution of intrinsic branches for Asotin Spring Chinook covered a single ecoregion, Lower Snake and Clearwater Canyons. However, the current distribution (along with the complete intrinsic potential analysis) spans an additional ecoregion—Canyons and Dissected Highlands. These changes do not equate to a loss or substantial shift in distribution across ecoregions so the Asotin population is at *low risk*.

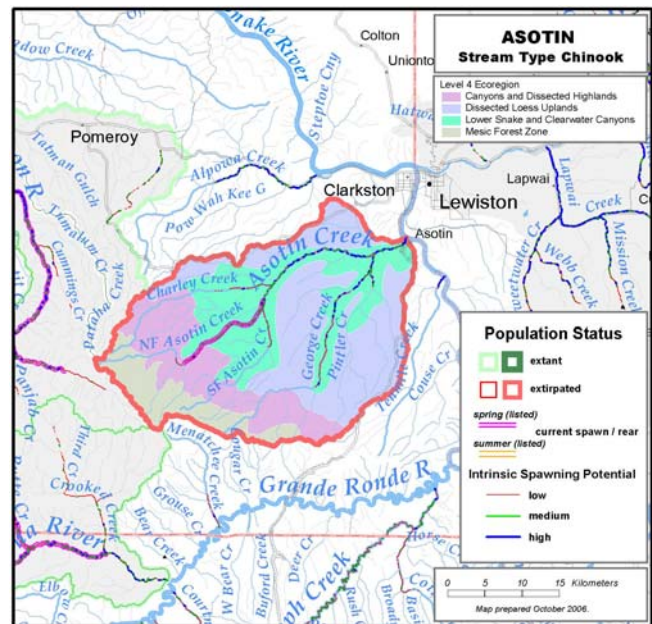


Figure 4. Asotin Creek Spring Chinook Salmon population spawning distribution across EPA level 4 ecoregions.

Table 2. Asotin Creek Spring Chinook Salmon population proportion of current spawning areas across EPA level 4 ecoregions.

| Ecoregion | % of historical spawning area in this ecoregion (non-temperature limited) | % of historical spawning area in this ecoregion (temp. limited) ^a | % of currently occupied spawning area in this ecoregion (non-temperature limited) |
|------------------------------------|---|--|---|
| Canyons and Dissected Highlands | 0.0 | 0.0 | 20.6 |
| Lower Snake and Clearwater Canyons | 100.0 | 100.0 | 79.4 |

^aTemperature limited areas were assessed by subtracting area where the mean weekly modeled water temperature was greater than 22°C.

B.4.a. Selective change in natural processes or selective impacts.

Hydropower system: Low risk, although it has slowed out migration for early and late out migrants, but in recent years flow augmentation has reduced the impact to the middle 95% of the run.

Harvest: Low risk in recent generations. Harvest rates effect < 20% of the adults and selective gear reduces the impact of selectivity.

Hatcheries: Low risk, broodstock management of the Chiwawa supplementation program has been designed to be non-selective.

Habitat: Low risk, although low flow in Asotin Creek from water withdrawals could prohibit run timing for late arriving adults, the impact has not been quantified.

Based on low risk estimates across the four sectors, we conclude that the population is at *low risk* for this metric.

Spatial Structure and Diversity Summary

Table 3. Asotin Creek Spring Chinook Salmon population spatial structure and diversity risk rating summary.

| Metric | Risk Assessment Scores | | | | |
|----------|------------------------|-------------------|----------------------------|-----------|------------|
| | Metric | Factor | Mechanism | Goal | Population |
| A.1.a | H (-1) | H (-1) | High Risk (Mean = -2/3) | High Risk | High Risk |
| A.1.b | H (-1) | H (-1) | | | |
| A.1.c | NA (0) | NA (0) | | | |
| B.1.a | VL (2) | VL (2) | High Risk (-1) | High Risk | |
| B.1.b | M (0) | M (0) | | | |
| B.1.c | H (-1) | H (-1) | | | |
| B.2.a(1) | M (0) (no data) | High Risk (-1) | High Risk (-1) | | |
| B.2.a(2) | M (0) (no data) | | | | |
| B.2.a(3) | M (0) (no data) | | | | |
| B.2.a(4) | M (0) (no data) | | | | |
| B.3.a | L (1) | L (1) | L (1) | | |
| B.4.a | L (1) | L (1) | L (1) | | |

Overall Risk Rating:

The Asotin spring Chinook population is not currently viable. Of particular concern is the high risk rating with respect to abundance and productivity. The population cannot achieve any level of viability without improving its status on the viability curve for both abundance and productivity. Spatial structure and diversity is currently rated as high risk. Improvement of the spatial structure and diversity status to moderate risk would be required to allow the Asotin population to achieve a “viable” or “minimum viable” status (in addition to the improvements needed for abundance and productivity). Due to the natural limitations of a basic, category A population, the Asotin could never achieve “highly viable” status. Based on the MPG guidelines, the Asotin population only needs to achieve “minimum viable” status for its contribution to recovery of the MPG.

| | | Spatial Structure/Diversity Risk | | | |
|------------------------------------|-----------------------|----------------------------------|-----|----------|--------|
| | | Very Low | Low | Moderate | High |
| Abundance/ Productivity Risk | Very Low (<1%) | HV | HV | V | M* |
| | Low (1-5%) | V | V | V | M* |
| | Moderate (6 – 25%) | M* | M* | M* | |
| | High (>25%) | | | | Asotin |

Figure 5. Asotin Creek Spring Chinook Salmon population risk ratings integrated across the four viable salmonid population (VSP) metrics. Viability Key: HV – Highly Viable; V – Viable; M* – Candidate for Maintained; Shaded cells-- not meeting viability criteria (darkest cells are at greatest risk).